AMERICAN
JOURNAL OF SURGERY

VOL. XL. JANUARY, 1926 No. 1

TRANSACTIONS OF THE SECTION OF SURGERY, NEW YORK ACADEMY OF MEDICINE

MEETING OF JANUARY 2, 1925
THE CHAIRMAN, DR. JOHN J. MOORHEAD, PRESIDING

A STUDY OF SUBDIAPHRAGMATIC ABSCESS
WITH AN ANALYSIS OF THIRTY-TWO CASES*

ALLEN O. WHIPPLE, M.D., F.A.C.S.,
NEW YORK CITY.

Of the various intraabdominal abscesses the most important for clinical study is the subdiaphragmatic variety. The surgeon especially dreads this type of abscess for it is his lot to treat this lesion and his misfortune to have this abscess appear as a complication in patients who, after a severe operation, appear to be on the high road to recovery.

There are very good reasons for considering the subdiaphragmatic the most serious of the intra-abdominal abscesses. Briefly, some of these reasons are:

1. The lesion appears as a complication in the most severe peritoneal infections, such as perforated ulcer, ruptured appendicitis, gangrenous cholecystitis;
2. It frequently does not appear until late in the course of the illness of a patient, septic and enfeebled by long-standing infection or tumor;
3. It is insidious in its onset and course;
4. It is difficult to differentiate from an associated pneumonitis or a pleural effusion;
5. The irregular drainage from the established drainage tracts of the original and causative lesion distracts the surgeon from the consideration of a new focus of infection and often long delays the diagnosis and treatment;
6. The treatment is a real problem because drainage is difficult and usually inadequate;
7. The mortality in the undrained cases is about 90%, in the drained cases about 30%.

ETIOLOGY

Subdiaphragmatic abscess is the result of infection by organisms, usually in large numbers, reaching the subphrenic area by direct continuity with or by gravitation from a perforated or leaking viscus or from a pyogenic infection carried to the area from a more distant focus. The great majority of the abscesses form, as a result of fluid having escaped from the gastro-intestinal tract before or during operation. A review of over 1000 collected cases shows that the focus of infection was the stomach in 25%, the appendix in 21%, the biliary tract in 16%, the duodenum in 5% of the cases. Infections of the liver, the kidney, the spleen, the pancreas, the female pelvic organs, the pleura and lungs and the lymph glands in the vicinity are relatively less frequent causes.

In the 32 cases in our records at the Presbyterian Hospital the foci of infection were as follows:

Biliary tract	8	Hepatic abscess	2
Stomach	4	Perforation of the intestine	2
Duodenum	3	Empyema	2
Appendix	5	Kidney	2
Pelvic inflammatory lesions	3	Pneumococcus peritonitis	1
Undetermined but associated with a tuberculous focus			2

The exciting organisms found were:

Colon bacillus	13	Pneumococcus	2
Streptococcus	9	Bacillus pyocaneus	2
Staphylococcus	5	Tubercle bacillus	1
Welch bacillus	4	Undetermined	7

From the etiological factors it is evident that the contents must vary considerably, but by the time the lesion is discovered pus has formed and in addition the abscess may contain blood, bile, food remains and other foreign bodies. From one-third to one-half of the cases will show gas, usually caused by the colon bacillus and anaerobes from the gastrointestinal tract. The majority of these abscesses are extremely foul. When explored with a needle or when opened surgically they give immediate evidence of putrefactive changes in their contents. The presence of gas is of the greatest aid in establishing the diagnosis. This will be discussed under diagnosis.

SYMPTOMATOLOGY

Because of the many factors involved in the formation of subdiaphragmatic abscess there is no clear-cut syndrome. The abrupt or gradual contami-

*From the Surgical Department of the College of Physicians and Surgeons, Columbia University, and the Surgical Service of the Presbyterian Hospital, New York City.

nation of the subphrenic area, the infecting organism, the side and site of the abscess and the general condition of the patient are the most important variables in the development of symptoms.

As the surgeon sees these cases they may be divided into three main groups:

1. Cases with an abrupt onset of symptoms typical of an "acute abdomen." These cases after a subsidence of their severe initial symptoms due to localization of the infection, develop a septic temperature with rigors and drenching sweats, rapid loss of weight and strength; and they show symptoms and signs referable to the chest. The great majority of this group of cases give an antecedent history of a chronic lesion such as ulcer, cholecystitis, salpingitis or lung abscess.

The first clinical history of phrenic abscess on record is a classic example of this type. This patient, a woman of 39, gave a history of chronic gastric ulcer for which she was treated in Guy's Hospital. The subsequent history of the acute onset is so graphic and clear that I quote from Barlow's original paper published in the *London Medical Gazette*, May, 1845: "These symptoms having abated she left the house (hospital) and was about as well as usual until October 24 (1844) when, whilst employed at her domestic duties, she was suddenly seized with intense pain in the left side and shoulder and great difficulty in breathing. She lay down and fainted, and when she was restored, so great was her dyspnoea that she felt she was about to be suffocated. These symptoms continuing she was after two days again admitted into the hospital. Her subsequent course was marked by the development of typical signs of shifting dulness and tympany in the left lower chest and a progressive sepsis. Autopsy showed a perforated gastric ulcer near the cardia with an enormous collection of pus and gas beneath the left leaf of the diaphragm." Barlow's description of the physical signs and his analysis of them is remarkable and makes him worthy of the distinction of having first described a clinical case of subdiaphragmatic abscess.

In the 32 cases of our series we find 11 that give the history of a sudden onset of acute abdominal symptoms, a period of subsidence followed by sepsis, and signs referable to the lower chest. The lesions in this group were:

Perforated gastric or duodenal ulcer	3
Appendicitis with abscess	4
Acute pelvic peritonitis	2
Acute pancreatitis	1
Ruptured ileum	1

These are really unrecognized or neglected cases of "acute surgical abdomen."

2. A second main group of subdiaphragmatic abscess is of those that develop insidiously in patients with either an obscure lesion, such as a carcinoma of the posterior wall of the fundus ventriculi, or in the cases having chest signs due to empyema, pleurisy, pneumonia or liver abscess, where the invasion of the subphrenic space is gradual and the change in physical signs difficult to elicit. These patients are usually septic or extremely debilitated before the onset of the subphrenic involvement and no alteration of their clinical course is indicated by changes in temperature, pulse, weight and strength. These abscesses are frequently unsuspected until found by the pathologist. There were 13 cases in this second group in our series.

3. The third, and to the surgeon the most significant group, is of cases that develop a subdiaphragmatic abscess following an operative procedure, with the subphrenic space involved at the time of the operation. To the conscientious surgeon they are a source of great worry and sometimes recrimination for he cannot but feel that had he used a different procedure, a different drainage, a more guarded approach, the abscess might not have developed. Some of these abscesses are due to faulty or careless drainage and operative technic, but many of them follow operations in patients desperately ill with peritonitis, cholangitis or long-standing sepsis, as in liver abscess. The surgeon should blame himself if he has not taken every precaution to avoid leakage from an infected focus, if he has been careless in his hemostasis, if he has not established adequate drainage in the presence of necrotic peritoneum, insecure closure of a portal of infection, or persistent oozing of blood or bile in the region of the operative field.

In our series of 32 abscesses there were 8 cases where the subphrenic space was free from infection at the time of operation. These merit individual description.

1. An interval cholecystectomy, uncomplicated and so easy and clean that drainage was not used. On the second day the patient complained of severe upper abdominal pain and went into shock. On the sixth day she showed signs of a high and domed diaphragm and shifting tympany. Roentgenogram showed a gas bubble beneath the elevated right diaphragm. Drainage. Recovery.

2. An interval cholecystectomy with drainage. In reinserting the drainage tube on the second day, the ward surgeon made a false passage in the tract and *x*-ray examination later showed this to lie in the anterior right subphrenic space. Abscess developed and was drained. Recovery. The error in this case was disturbing a deep drain in a stout woman at so early a date.

3. An acute gangrenous cholecystitis and cholangitis in an obese elderly man. Cholecystectomy

with drainage. There was considerable local peritonitis with leakage of bile. The patient drained profusely bile and purulent exudate from his subheptic space. Subdiaphragmatic abscess may have developed from a colon bacillus liver abscess but this could not be demonstrated. Secondary operation: drainage of subphrenic area. Recovery. This patient might have done better with a cholecystostomy for there were no stones.

4. A desperately sick woman of 42 with several severe hemorrhages from a duodenal ulcer into which a large branch of the pancreatico-duodenal artery opened. Resection of pylorus. Leakage from duodenal stump with right subphrenic abscess and duodenal fistula. Death on the twelfth day. An unavoidable result and not due to faulty judgment or technic.

5. A large stenosing ulcer of duodenum. Polya-Balfour operation. Angulation of the loop at the stoma. Duodenal stump leakage with right subphrenic abscess. Operation and drainage. Massive lobar pneumonia, seventh day. Death. This was due to an error in technic in using a vertical loop for the stoma.

6. Repair of a fecal fistula with drainage following resection of ascending colon. Right subdiaphragmatic abscess. Drainage. Recovery. It is difficult to place the blame in this case. Every precaution was taken to prevent contamination.

7. Acute pancreatitis, chronic colon bacillus cholangitis, jaundice and fever for five weeks before coming to the hospital. Cholecystectomy and choledochostomy drainage of subhepatic space. She developed a severe oozing into her subheptic space. Infected hematoma, right subdiaphragmatic abscess. Drainage. Right colon bacillus empyema. Drainage. Death from sepsis and asthenia associated with her pancreatic lesion on the 64th day. I cannot place any blame in this case except on the two physicians who let this patient go for five weeks with persistent jaundice and severe cholangitis before advising surgical therapy.

8. A most interesting case of interval cholecystectomy with drainage. The cystic artery was insecurely ligated. On the second day a rather brisk subhepatic hemorrhage. For several days thereafter physical and *x*-ray examinations showed a high right diaphragm. Lack of temperature elevation and other signs of infection favored observation. Signs cleared up in 10 days. *X*-ray films showed return to normal of the right diaphragm. This case showed undoubtedly a collection of fluid in the subphrenic space which resolved without suppuration. Possibly it should not be included under the title of this paper.

It is a sound clinical observation, but one easily overlooked, that subphrenic abscess should be suspected in every case of abdominal operation where there are an unexplained septic temperature, sweats and loss of weight and strength.

The typical symptoms of subphrenic abscess are a rising temperature, later becoming church steeple in type, a rapid pulse, low respiratory rate, evening sweats, rapid loss of weight and strength. Pain is variable with the side and the site. Hiccough is not infrequent. A feeling of soreness is usually complained of.

Physical signs: The patient looks and acts septic. The respiratory excursion is usually diminished on the affected side; there usually is an appreciable bulge especially if the abscess is in the anterior subphrenic space. There is retraction of the intercostal spaces in some of the early cases.

On examination of the chest and upper abdomen a dome-shaped elevation of liver dulness is often made out, especially in the midaxillary line. If gas is produced in the abscess tympany shifting with the patient's position is the most important percussion sign. The liver edge may be felt. Posteriorly one usually finds dulness from the spine of the scapula down, to tympany to flatness. Fremitus is absent from the lower half. On auscultation a splash may be elicited, egophany is often heard over the fluid, diminished breath sounds over the lower chest.

Laboratory findings: The white count is usually high, 20-25,000, with polymorphonuclear count over 85%. Roentgenography gives the most important findings. As a rule it shows a definitely and at times strikingly high leaf of the diaphragm on the affected side. If gas is present it will show, if the patient is in the sitting or lateral posture, and changing the position will give a change in the fluid level. This gas bubble is frequently lost if the patient is supine. Turning the patient for a lateral plate is essential. The striking thing about these films is that they show the shifting fluid level below the diaphragm.

The use of the exploratory needle is mentioned here only to condemn it, for too often the pleura is contaminated and an empyema is superimposed upon a subphrenic abscess. It should not be used save on the table with the patient ready to be operated upon. Once pus is found the needle should be left in for the incision to follow it.

Differential Diagnosis

Much the most difficult to differentiate from subphrenic abscess are the thoracic and pulmonary lesions. Not infrequently these are present in addition to the subdiaphragmatic condition. In the series under consideration 10 cases were associated with an empyema which either preceded or followed the subphrenic abscess, 4 had a pleurisy with effusion, 7 had a pneumonia, in several cases associated with either pus or fluid. It is evident that both in physical

signs and in *x*-ray examination these cases were the most difficult to differentiate from the subphrenic lesion.

Liver abscess is extremely difficult to rule out in some of these cases, as are perinephritis and renal tumor. The *x*-ray is by and large the most valuable single means of determining the size, site and side of the lesion.

TREATMENT

There is a measure which I am firmly convinced is of great value in preventing the development of a subphrenic abscess. This applies to cases of upper abdominal drainage such as is done for cholecystectomy or choledochostomy and consists of turning the patient over on the face two or three times a day after the first week of the operation. This has a very definite effect of emptying or draining the puddle of fluid that has a tendency to collect in the subhepatic space. Another precaution against this spread from a subhepatic collection to a subdiaphragmatic space is to leave drainage in long enough for a tract to be established. Considerable stress is laid by most writers on the subject upon early incision and drainage of the subphrenic abscess. This is undoubtedly wise once the diagnosis of abscess is established; but early needling and too early exploring of the subdiaphragmatic area may do considerable harm and may result in a subphrenic infection where none had existed. Daily *x*-ray and physical examination with notes for comparison will usually determine in three or four days whether an abscess is really present.

As a rule the tenth rib in the midaxillary line is the best approach. Under paravertebral novocain injection going two rib spaces above and below the tenth rib will give much better anesthesia than the local over the line of incision alone. Either the intercostal incision or removal of a segment of rib will give good exposure and drainage, provided the incision is long enough. The mistake too frequently made is too short an incision, too small a segement of rib removed. The newer, electrically lighted, so-called illuminated retractors are of great help in inspecting the size and site of the abscess. Care in avoiding the pleura by pushing it up by gauze dissection will prevent much trouble.

Two large soft rubber tubes, so arranged that they can be connected to bottle drainage for irrigation purposes afford the best drainage. The wound edges do well with dichloramine—or iodoform—gauze packing. Little or no suturing is necessary. Within one or two days we begin dakinization if the abscess wall is well formed and has no peritoneal communications.

[Dr. J. Eastman Sheehan read a paper on Plastic Surgery, which has been published in the *New York Medical Journal and Record*.]

PRESENTATION OF CASES

ESOPHAGEAL DIVERTICULUM; OPERATION; RECOVERY

DR. JOSEPH E. J. KING

G. O., male; 45; married; electrical engineer. Past history negative except for tuberculosis of the cervical lymph nodes of the left side, for which he was operated upon eight years ago by Dr. Dowd in the Roosevelt Hospital under general anesthesia, and from which recovery was uneventful.

About two years ago the patient began having a dry cough which he attributed to smoking cigarettes. During the last three months before operation he observed that at night when he lay down there was a regurgitation of food similar to vomiting. There was no regurgitation when he was in the upright position. The material regurgitated was food taken during the day. There was no foul odor, and there was no pus. The regurgitated material was not sour or bitter. He consulted his attending physician, Dr. Oliver L. Austin of Tuckahoe, N. Y., who suspected an esophageal diverticulum, and ordered radiographic barium meal. The radiographic plates made by Dr. L. B. Goldhorn of Mt. Vernon, N. Y., revealed an esophageal diverticulum. The antero-posterior plate showed the lower portion of the diverticulum, apparently, in the midline. A portion of barium substance had been regurgitated, leaving a definite level of barium opposite the junction of the 2nd and 3rd dorsal vertebrae. The lowest portion of the diverticulum extended to about the middle of the 4th dorsal vertebra. That portion of the sac which contained the barium, and thus could be seen on the plate, measured 2″ in a transverse direction. In a vertical direction the diverticulum retained barium 1¼″ in depth. The lateral plate showed the diverticulum at a position nearer the vertebral column than the sterno-clavicular articulation. It measured in a transverse direction 1¼″, and about the same distance in a vertical direction. Both plates were exposed in a standing position.

When the patient was first seen by me in the Lawrence Hospital, Bronxville, N. Y., the diagnosis of esophageal diverticulum had thus been made and confirmed by radiographic findings. The site of the origin of the diverticulum, however, was not known, neither was its exact position in an antero-posterior direction determined. It was not known whether it was right- or left-sided. Since most diverticula arise from the left lateral wall of the esophagus, it was assumed that this one was left-sided, but in order definitely to locate its position, examination under the fluoroscope was advised.

To facilitate feeding during the post-operative course an attempt was made to pass a duodenal tube, the intention being to allow it to pass into the stomach only. Each time, however, the beaded end of the tube would pass for a certain distance and there become lodged. The patient stated that it felt as if it lodged in his neck. Radiographic plates showed the tube apparently lodged in the diverticulum located on the left side. This information was not conclusive, however; therefore on April 21, 1924, a fluoroscopic examination was made by Dr. Goldhorn and myself. It showed:

> "The esophageal diverticulum arises from the left side. It is about four inches in length. The mouth, or opening of the sac is opposite the fifth cervical vertebra. The fundus, or pouch-like distal extremity is in the chest cavity below the level of the clavicle, and on a level with the body of the fourth dorsal vertebra. The sac is situated deep beneath the musculature of the neck and the great vessels, occupying a position opposite the apposition of the esophagus and vertebral column. The sac readily fills with the barium meal substance, but the upper half of it is immediately regurgitated so that only a portion remains in the lowest part of the sac as shown on the radiographic plates."

OPERATION: April 22, 1924.

Pathological findings: The diverticulum was found to be in the exact position determined by the fluoroscope. The neck was somewhat long and narrow. The lumen was about the size of one's forefinger. From the mouth of the diverticulum to the tip of its fundus it measured about 4 inches. The diverticulum lay alongside of the esophagus, and the

vertebral column on the left side extending into the thoracic cavity. The specimen consisted of the amputated diverticulum, which immediately contracted after dissection from its bed and removal. The walls were rather thick, and were not attenuated, and consisted of the same layers as did the esophagus. There was no evidence of inflammation either on the mucosa or about the diverticulum. The removed portion was stuffed with cotton and a photographic record made.

Procedure: Local anesthesia (Novocain 1% and ½% solution with suprarenin). With the patient in a sitting position a paravertebral injection was made on the left side extending from the first to the seventh cervical vertebra. The area was completely anesthetized by blocking off the left fifth nerve along the lower border of the jaw, an anterior midline injection for blocking off the opposite side, and a supraclavicular injection to block off the branches from the thoracic nerves. The anesthesia was satisfactory, and the patient made no complaint throughout the procedure. A straight incision was made directly over, and parallel to, the anterior border of the sterno-mastoid muscle extending from just below the lower pole of the parotid gland to the clavicle. The approach to the diverticulum was direct following the line of cleavage, by retracting the sterno-mastoid muscle the carotid sheath and its contents backward and outward, and the trachea, larynx, laryngeal nerves, left lobe of the thyroid gland and the esophagus inward and forward. It was necessary to divide only the following structures, none of which was important: the anterior belly of the omohyoid muscle, the superior thyroid artery, the common facial vein and the lower small muscular branches of the descendens hypoglossi nerve supplying the sternothyroid muscle. The main trunk of the nerve itself was not disturbed. (This approach, in my opinion, is the proper one for exposure of the diverticulum as it lay in its position on the outer side to the left of the esophagus.)

The diverticulum was carefully dissected out of its bed. The fundus was pulled up from alongside of the esophagus without entering the pleural cavity. There was no evidence of an inflammatory process about the sac. After the sac was dissected free and its neck well isolated, the musculature about the neck was divided, leaving the mucosa intact. Two strong, curved clamps were applied at this site on the mucosa only. The operative field, which was well exposed by self-retaining retractors, was packed off with gauze wet in Dakin solution, and the neck of the diverticulum was divided with a knife repeatedly dipped in carbolic acid, and the diverticulum was removed without soiling the field of operation. The stump of the diverticulum was wiped with alcohol, and was sutured over distal to the clamp, and with the clamp still applied, with a continuous suture of fine chromic catgut No. 000 with a small needle, the sutures being placed close together to prevent leakage. A reverse suture was taken in the opposite direction and tied. The clamp was removed, and no leakage occurred. The stump of the diverticulum, which was left about one-half inch in length, was then inverted and buried by three superimposed layers of chromic catgut No. 00.

During the procedure up to this time conversation with the patient was indulged in to assure the operator that the laryngeal nerve had not been involved. After suturing of the esophagus had been completed, the patient was given a glass of water to swallow. This was accomplished with no difficulty, regurgitation or leakage.

The upper angle of the incision was closed for about one inch with interrupted suture of black silk placed as vertical mattress sutures to prevent inversion of the skin edges. The remaining part of the incision, which constituted over 5/6ths of the incision, was packed, after being washed out with Dakin solution, with double strips of iodoform gauze, five in number, the most inferior of which occupied the position which was previously occupied by the most distal portion of the diverticulum in the thoracic cavity. A copious wet gauze Dakin dressing was applied and held with bandages including head, neck, and both axillae. The procedure was satisfactory, and the patient's condition on leaving the table was good.

Post-Operative notes: April 23, 1924. The patient's temperature during the night rose to 102.2°; his general condition was good, however. The wound was dressed; condition of wound good. Has received only tap water per rectum. Not allowed to swallow. During the day the temperature dropped to 101°.

April 24, 1924: The patient has had a cough which is believed to be reflex for the most part from the operative field and the gauze packing. He has not vomited. The uppermost gauze packing removed today. Allowed to take small sips of water which was accomplished without difficulty or regurgitation. He has received glucose 10% solution per rectum. General condition is good. Temperature 99.6°. Dressed daily.

April 26, 1924: The lowermost gauze packing removed as well as the sutures in the uppermost angle of the incision. Temperature normal.

April 29, 1924: The last piece of gauze packing removed. No leakage from the suture line. A piece of gauze wet in Dakin solution inserted throughout the full length of the open incision.

May 1, 1924: Out of bed. The superficial gauze packing in the wound, which has been changed daily, removed. The lowermost portion of the incision closed by two secondary sutures; the upper portion closed by strapping with sterile adhesive plaster.

May 4, 1924: Patient discharged to his home, (12th day after operation). During the last four or five days he has been taking a large amount of fluid, cooked cereals, etc. Temperature reached normal since the third day following operation.

Jan. 2, 1925: Patient went to work about three weeks after his discharge from the hospital, has gained twenty pounds, and has had no difficulty with swallowing. The cosmetic result is good.

Discussion

DR. ALLEN O. WHIPPLE: I would like to ask Dr. King if he has ever inverted the diverticulum. This avoids the risk of leakage. Some of these cysts rupture easily on being removed. I must say, however, that I do not see how his method of operating could have been improved upon in this case.

DR. KING: I have never inverted a diverticulum. I have seen only three of these cases and they were all extirpated. Two were slightly infected because the wounds were not left open; that is why I left this one open and there was no infection.

ECHINOCOCCUS CYST OF THE LIVER; EXTIRPATION; RECOVERY

DR. JOSEPH E. J. KING

S. L., 48, Italian, truckman, married, a fairly well nourished man, presents a negative history up to 1920 when he fell in a freight elevator upon breaking of the cable. He was unconscious about ten minutes. He vomited and spat up a small amount of blood. It is not known whether the blood was from his stomach or from his mouth. He was examined by an insurance company's physician, and sent home. He did not remain in bed but returned to the company for whom he worked and carried on with light duty as a watchman. He worked for a period of about two and one-half years following this accident. He was never jaundiced. His appetite was good. He had no pain during the first part of this time. About two and one-half years before he was seen by me, he stated that he had slight pain in the upper part of his abdomen, and that he could feel a small mass in the right side of the upper abdomen. He had no fever, and not enough pain to keep him away from his work. Belching has not been a prominent symptom. During the last 4 months he vomited from time to time, but his appetite was usually good. He was not constipated.

On April 7, 1924, he consulted me. General physical examination was negative except for the local condition. There was a mass in the right hypochondriac region in the neighborhood of the lower border of the liver. It could be seen as a slightly rounded protrusion just beneath the lower

border of the ribs on the right side, about 2½ inches from the midline. It was fairly firm and slightly tender, but pressure did not produce acute pain. The mass moved with respiration. It was believed that the mass was attached to the liver. There was no elevation of temperature, and no signs or symptoms of gallbladder disease.

The man was sent to the New York Skin and Cancer hospital on April 9, 1924, for further study. Radiographic plates, which were indistinct, showed, however, a mass. The blood Wassermann reaction, was 4-plus. On account of having seen a laparotomy performed in 1911 on a case which proved to be gumma of the liver, it was decided to put the patient on antiluetic treatment, especially in view of the Wassermann reaction; and this was done for a period of a little over two weeks. During this time the patient complained of some pain in the region of the mass. Therefore, especially since he insisted, he was sent again to the New York Skin and Cancer Hospital for operation, with a provisional diagnosis of tumor of the liver, probably cystic.

Operation, April 28, 1924.

Pathological findings: There was a mass protruding from the lower border of the liver between the gallbladder and the round ligament. It appeared to be cystic. There was an area of the tumor exposed measuring about 1½" x 2". The remainder of the cyst wall on the anterior surface was imbedded in the liver tissue, and had drawn the liver margin down over it so that the mass was more than half submerged within the liver itself. Aspiration of the cyst gave some milky fluid. Therefore it was believed that the lesion was an echinococcus cyst. The cyst was completely enucleated from the liver substance without rupture. The cyst was about the size of an orange, and measured in a vertical direction 3¾", in a horizontal direction 3", and in the anteroposterior direction 2½". It had a firm, fibrous capsule, calcareous in places. Portions of the wall were from two to three cm. in thickness and composed of fibrous and calcareous material. The cavity was filled with a gelatinous material, and small transparent, opaque cysts ½" to 1" in size. These daughter cysts also in places contained granddaughter cysts from the size of a pinhead to ½" in size. Portions of these cyst walls were laminated and contained scolises, free hooklets and cholesterin crystals with débris. The main cyst wall showed some liver cells on the surface, and was composed of very dense non-nucleated tissue.

Procedure—A vertical incision 7 inches long was made through the right rectus muscle. This gave adequate exposure of the lesion. There was no evidence of any other lesion. The line of cleavage about the cyst wall was regularly followed, and the cyst was completely enucleated from the liver bed. The line of cleavage was easily followed, with clamping and ligation of blood vessels supplying the cyst wall as they were encountered. No portion of the cyst or the cyst wall was left in the liver. Blood from the liver surface was not profuse, and it could be readily controlled by sutures which approximated that portion of the liver overlying the upper portion of the cyst with that portion which was beneath the cyst. The liver tissue was surprisingly fibrous and tough, so that more traction could be put on the sutures without cutting in than is usually the case with liver tissue. This left a somewhat notched effect in the inferior border of the liver just medial to the gallbladder. In its removal there was but slight leakage from the puncture opening. The field of operation was well walled-off, however, and it is believed that no peritoneal soiling took place. The incision was closed in the usual manner with a small rubber dam drain to be removed in about three or four days.

The patient made an uneventful recovery and was discharged at the end of four weeks.

At the present time, he is working, has fully recovered, and has gained in weight about 25 pounds.

(No discussion)

COOPERATION OF ORTHODONTIA AND SURGERY IN THE TREATMENT OF ALVEOLAR AND PALATE CLEFTS

DR. HAROLD S. VAUGHAN

A boy, now 6 years old, came to the Post-Graduate Hospital at 3½ years of age with a history of an unsuccessful operation for bilateral harelip and cleft palate. There were incomplete union of the lip with flattened nasal ala, a very wide palatal cleft, and complete absence of the premaxilla. It had either been removed at the previous operation or had sloughed away. In that condition the case was regarded as inoperable and the child was turned over to Dr. Joseph J. Millard, the orthodontist. He reduced the cleft, so that I was able to close the palate by the usual method. There was still a large defect left from the absence of the premaxilla, and this was finally closed by two flaps from the under surface of the lip, one flap being turned to give a mucous membrane lining on the mouth side, and the other a mucous membrane on the nasal side.

Discussion

DR. JOSEPH J. MILLARD: As Dr. Vaughan had explained, it was necessary to contract the maxilla in order to reduce the cleft to a size that would permit surgical interference. To accomplish this, an apparatus was constructed consisting of a spring arch wire and a series of bands fitted to the four temporary teeth presenting on each side. These small bands were soldered together so as to obtain a movement of the bone fragment rather than a movement of the teeth.

As a result of the union of the four banded teeth in each bony fragment it was possible to obtain an even movement of the sections toward the median line. The contracting force was supplied by the spring arch wire. The cleft originally measured 1.5 cm. and after treatment it measured a little more than 0.5 cm. The actual time of treatment was five months.

EARLY UNION OF PREMAXILLA TO ALVEOLAR BORDERS IN BILATERAL HARELIP AND CLEFT PALATE

DR. HAROLD S. VAUGHAN

A boy, 5 years of age, had had an unsuccessful operation in early infancy for unilateral harelip and cleft palate. He was admitted to the Post-Graduate Hospital at 22 months of age and it was apparent that no attempt had been made at the previous operation to approximate the alveolar border. There was flattened nasal ala on the left side with union of the lip only along the lower border. There was a cleft through the alveolar border, hard and soft palate. The alveolar border on the right side of the cleft was displaced forward and outward and the left border was turned inward. The hard and soft palate were united at one operation, and the child was then placed in the care of Dr. Millard who approximated the alveolar borders by orthodontia. The lip and alveolar border were operated on later and the defect between them was closed.

Discussion

DR. JOSEPH J. MILLARD: This case varied from the previous one in that movement of only one side was indicated. The right side of the maxilla was practically in normal position while the left side was drawn in well toward the median line.

The apparatus was constructed with the idea of using the right side as an anchorage or a base from which force would be exerted to swing the left side out into normal line of occlusion. The expanding force was supplied by a spring arch. Active treatment extended over a period of four months.

DR. JOSEPH E. J. KING: I have little to say except a few words of commendation for this nice work that Dr. Vaughan has shown. There is no doubt that by far the best work in cleft palate and harelip cases is done by a combination of surgery and orthodontia. A surgeon attempting to do this work alone is a great disadvantage.

DR. CLARENCE A. MCWILLIAMS: I would like to ask Dr. Vaughan if he ever uses the Brophy method. I have had good success with it when I have been able to get the patients early enough. It enables one to close a huge defect sufficiently so that a secondary uranoplasty is possible and successful. It seems to me that the Brophy method is not used often by surgeons generally, principally because its technique is not well understood.

DR. VAUGHAN: I have used the Brophy operation, on a few patients but I do not make a practice of doing it as I consider it rather severe.

OLD UNUNITED FRACTURE, NECK OF FEMUR

DR. WILLIAM L. SNEED

A man, 55 years old, sustained a fracture of the neck of the femur fourteen months prior to entering the hospital. There was two and one-quarter inches upward displacement and the whole neck of the femur had been absorbed. A curved incision was made beginning below and lateral to the anterior-superior spine and extending down to opposite the base of the greater trochanter and then across the limb to the posterior border of the greater trochanter. A muscle—and fascia—splinting operation was done without dividing any of the muscle fibers. The trochanter was exposed and was chiselled up. The Y-ligament was dissected away from the bone and the head of the femur inspected. The cartilage was found bright and glistening and it was deemed wise to leave it in. Practically all bone was removed from the head of the femur by a reamer, leaving the cartilage. The ilio-psoas muscle was chiselled away from the upper part of the lesser trochanter leaving it attached at the lower border. The stump of the greater trochanter was rounded off and placed in the reamed-out head and the trochanter was lowered on the outer side of the femur about 1½ inches below its former site.

The limb was put up in abduction of about 20° and held with a long plaster spica. This was removed in five weeks and manipulation of the thigh was begun. The patient was walking with crutches in six weeks. He now is able to resume his former vocation as a librarian. He walks daily to and from the library, a distance of something over a mile. There is about one-half normal range of motion in every direction.

Discussion

DR. JOHN J. MOORHEAD: I would like to ask Dr. Sneed what type of operation the case most closely resembles.

DR. SNEED: The type of operation in this case, most closely approaches that done by Brackett who left the head in in selected cases. He did not chisel the trochanter, however, but dissected up the tissues about it. In the case I reported we chiselled off the trochanter and displaced it downward for one and one-half inches. In 1908 Flint took out the head, chiselled up the trochanter, and pegged it to the upper rim of the acetabulum and the side of the ilium. None of the operators, however, have paid any attention to chiseling up the great trochanter so as to lengthen, as it were, the ilio-psoas, and none have combined all the procedure of this operation I have just reported which is largely a compilation of different operative methods.

OLD TUBERCULOSIS OF THE HIP JOINT, WITH COMPLETE DESTRUCTION OF HEAD AND NECK. MARKED UPWARD DISPLACEMENT

DR. WILLIAM L. SNEED

A man, 28 years old, giving a history of tuberculosis of the right hip at the age of four; there were numerous sinuses and total destruction of the head and neck of the femur, with marked displacement upward of the trochanter on to the ilium, and flail hip. The patient had not walked at all since 1917. All sinuses had closed in 1919. On examination by me there was five and one-half inches shortening. The limb was placed upon traction and the trochanter pulled down until opposite the acetabulum. Incision similar to the first case was made. The region of the trochanter was explored and the tip of the trochanter chiselled up. The Y-ligament was dissected away and the ilio-psoas tendon chiselled from the upper part of the lesser trochanter. The upper rim of the acetabulum was identified and the outer part chiselled and turned up. A site for placing the stump of the trochanter in the thick part of the iliac bone just at the upper border of the acetabulum was reamed out, the stump of the trochanter was placed in, and the part of the trochanter that was chiselled loose was placed slightly down on the shaft of the femur. Immobilization in a long plaster spica done with the extremity in 20° abduction.

The cast was removed to the knee in five weeks. All support was removed in ten weeks and manipulation was begun. Operation was performed for stability but considerable free motion without pain was obtained, sufficient for the patient to sit in a chair with comfort. The range of motion in flexion estimated, from a fully extended position, is about 35°. The limb can be abducted about 15°.

Discussion

DR. MORRIS K. SMITH: I would like to ask Dr. Sneed if he prefers this operation to taking the head out as in the Whitman operation.

DR. SNEED: I prefer this method to the Whitman operation in selective cases,—for instance, where the cartilage of the joint is intact.

MEETING OF FEBRUARY 6, 1925

THE CHAIRMAN, DR. JOHN J. MOORHEAD, PRESIDING

PROPHYLAXIS OF FECAL FISTULA IN OPERATIONS FOR ACUTE APPENDICITIS

CHARLES L. GIBSON, M.D., F.A.C.S.,
Surgeon to the First (Cornell) Surgical Division of the New York Hospital
AND
WALTER P. SHERRILL

In addition to prophylaxis of fecal fistula, there will be described in this paper a method of treating fistulas resulting in their prompt and spontaneous cure, a second operation being seldom necessary.

We have had recently an important and splendidly frank contribution on this subject from one of the great masters of American surgery, John B. Deaver. He reports 5% of fecal fistulas in 4063 cases of acute appendicitis. In every instance, more or less pus was present and required drainage with gauze, cigarette drains or glass tubes. "Of the 200 fistulas 74, or 37%, healed spontaneously while 97, or 48.5%, required operative repair. The remainder, 29, or 14.5%, left the hospital having refused operation or were sent home to recuperate and to return later for operation, but failed to do so. No doubt a certain proportion of these latter closed spontaneously .... Twenty-three percent., of the cases presented either multiple fistulas or else the fistula was so large as to preclude closure with maintenance of the lumen of the bowel, surrounding the fistula, so that hope for the recovery of this portion of the bowel had to be abandoned. These

required resection, varying from a small portion of the cecum to resection of a foot or more of the terminal ileum with the cecum and entire ascending colon. Ileocolostomy was, of course, the last stage of the operation .... In eight instances there was a recurrence of the fistula, while nine cases died after operation from shock, cardiac failure or other causes."*

These results seemed so unusual that we have studied our own material which we find shows a very different situation.

From February 1, 1923, to January 1, 1925, we have had on the First Surgical Division of the New York Hospital 1583 ward cases of acute appendicitis with 19 fecal fistulas, 1.2%. There was no mortality. Eighteen of the 19 cases presented conditions of unusual difficulties, chiefly retrocecal position and long-standing abscesses. A third of the patients were past fifty. This factor is important as regards the activity of the normal process of repair.

The cause of fecal fistula may be divided into five groups:—

1. Ignorance, unskilfulness or bad judgment in the conduct of an operation, e.g., too strenuous an effort to remove an appendix which in the hands of that particular operator had better be left alone.

2. A retained appendix gives a large proportion of fecal fistulas.

3. Inherent conditions which almost inevitably are followed by fistulas, such as necrosis—actual or potential—of the base of the appendix or the cecal wall. Also a factor is the patient's recuperative power.

4. The use of improper drainage by rigid material, particularly tubes of any kind or gauze adhering to a damaged intestine.

5. Insufficient drainage. This applies more particularly to minimizing the effects of a fistula once it has occurred.

We believe, and present our results as evidence, that fecal fistulas can be largely prevented by:

(1) Careful operating with an incision well placed and sufficiently large for a workman-like job. Particularly with the retrocecal appendix, rough handling can be avoided by incising the outer lateral reflection of the peritoneum of the cecum, allowing of the rolling out and a clear view of the cecum and appendix.

(2) In a very few cases, even a very good operator may wisely leave in an appendix rather than run the risk of doing great damage which may give rise to difficult, dangerous or possibly fatal secondary operations. If he has left in an appendix, but has done no damage, a secondary operation will be simple and successful. (In our two cases of retained appendices that developed fecal fistula it healed spontaneously.)

(3) With a gangrenous condition of the cecum we should try to forestall the consequences by suitable covering of the dangerous area; but we realize that these efforts are generally unsuccessful. In theory, the inversion of the appendix rather than its simple ligation should be a help. It is possible, however, that in a precarious condition of the cecal wall, the purse-string or other suture may defeat the purpose by strangulation of devitalized tissue. (A fecal fistula developed in three of our cases after inversion of the appendix.)

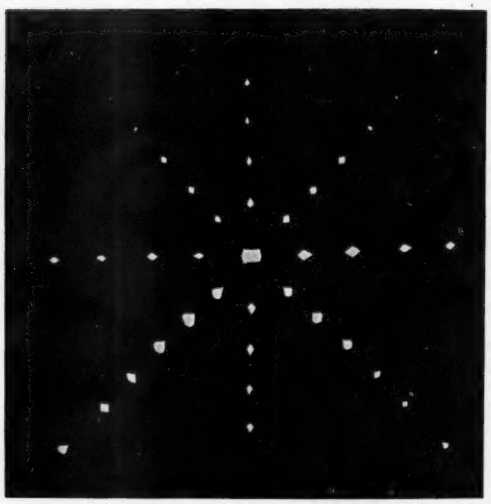

Fig. 1. Rubber dam showing arrangement of holes.

We should, therefore, anticipate a possible fistula and establish conditions permitting of its speedy and spontaneous closure, which is best realized, I believe, by leaving the wound largely open and drained by the very efficient rubber dam Mikulicz tampon. Any sinus will heal better and quicker if it has continuous and wide open, or as I call it, "frictionless drainage"—wide open drainage with suitable material, avoiding anything that may cause pressure or adhesion of devitalized tissue.

Our 19 cases were drained as follows:

Mikulicz rubber dam tampon—14 cases
Large rubber tube and rubber dam—1 case
Rubber dam—1 case
Cigarette drain—2 cases
Rubber tissue—1 case.

It will be noted that a tube (rubber) was used only once eleven years ago, the Mikulicz rubber

*John B. Deaver: Appendical Fecal Fistula, *Annals of Surgery*, 1924. Vol. 80, pp. 56-58.

dam tampon, or folded rubber dam strips, being generally used. The cigarette drain, which does about everything but drain, was used twice; but not by me. It will be noted that we do not use unprotected gauze which can produce much mischief and should be discarded as archaic.

RESULTS

We have follow-up notes on 17 of our 19 cases. The two missing had spontaneous closure of the fistula before leaving the hospital. Seventeen, (88%), healed spontaneously, and for the most part promptly:—

9 (47%) closed spontaneously within 18 days.
8 closed spontaneously in the following time:—
3—about one month.
1—6 weeks
4—fistula still discharging when patients left the hospital; but when seen at follow-up clinic, three months later, were all healed. Exact time not recorded.
2 cases (12%) required operation for closure of the fistula.

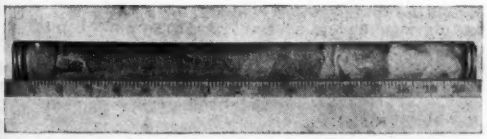

Fig. 2. Prepared sterile rubber dam in sealed tubes

One of these was really for the ablation of the stump of an imperfectly removed appendix. The other was for the closure by simple inversion and suture of a small hole in the ileum. This was the one case (11 years ago) in which a rubber tube was used.

Only such simple, effectual and safe operations will be necessary in the rare cases not closing spontaneously. Compare them with the numerous and formidable procedures and results quoted, following methods which are in violent contrast to our practice.

In recent years we have followed the advice of the late Professor Soubbotitch of Belgrade and occasionally applied tincture of cantharides on a swab to the fistulous tract. We have no very definite data of the results; but we have in mind an occasional case that closed so rapidly after such application that we believe it has a measure of usefulness.

The rubber dam Mikulicz tampon has been used by me about twenty-five years. The rubber dam has been described in several articles. * *

*C. L. Gibson: Postoperative Intestinal Obstruction. *Annals of Surgery*, 63, April, 1916.
C. L. Gibson: The Rubber Dam Mikulicz Tampon. *Annals of Surgery*, 73, 471, April, 1921.
C. E. Farr: Gibson-Mikulicz Tampon in Acute Appendicitis. *Annals of Surgery*, 73, 473, April, 1921.
R. C. Webb and L. E. MacFarlane: Gibson Rubber Dam Tampon in Acute Appendicitis. *Minnesota Medicine*, 6, 632, November, 1923.

A square piece of dental rubber dam is introduced into the bottom of the wound while pads and retractors are still in place. The apex of this cornucopia-shaped material is cut out, leaving a hole an inch in diameter. It has also, two or more rows of small holes (figure 1). It is filled with gauze packing, distending it amply. The packing is partially removed the following day and on the second day the whole tampon is generally removed and replaced by a strip of folded rubber dam.

The size of the tampon varies; but a larger size 15"x15" is always useful and can be trimmed down if unwieldy. A supply of these tampons sterilized and in sealed test tubes is held on hand (fig. 2.) In an emergency a rubber glove with the fingers cut off makes a good substitute.

Discussion

Dr. Robert T. Morris: One cause for fistula is perhaps the carrying of some drainage device too closely against the bowel wall. Circulation is interfered with but also and more particularly the exudation and deposit of a protective layer of lymph. For the most part, Dr. Gibson's methods are commendable, but I do not quite like the idea of carrying the drainage device so close to the bowel. Dr. Gibson does not like to use the cigarette drain; I do. I prefer a small incision and a cigarette drain. If we free the cecum, drop it down and keep it away from the anterior abdominal wall, spontaneous closure of a fistula is the rule. I have seen fistulas remain open for a long time because of the idea of gross cleanliness; nurses or physicians washing out the fistula too often, especially with peroxide of hydrogen. I was responsible for the introduction of peroxide of hydrogen into surgery and am sorry about it. It destroys the layer of protective cells which guard the area against infection. It destroys repair cells also. These fistula cases do better under neglect than they do when under careful cleansing.

Dr. Charles E. Farr: I can speak with some experience of the success of Dr. Gibson's methods because I was working in the New York Hospital before these methods were used and saw many fecal fistula cases. Since these methods have been in use I have seen very few. If the cavity is kept wide open the presence of pus under pressure is eliminated and pus without pressure cannot do harm. If pressure is eliminated by this tampon and the cavity is kept clean there is little likelihood of a fistula forming. I am very enthusiastic concerning this method of handling suppurative cases.

Dr. Gibson: I have nothing to add to the discussion. I meant merely to call attention to the fact that by this method we offer, one will have to reoperate only in one case in 800. I think that is sufficient answer to criticism.

Dr. Oswald L. Lowsley gave a moving picture demonstration of Kidney Operations Under Regional Anesthesia.

PRESENTATION OF CASES

CASES OF KIDNEY OPERATIONS UNDER REGIONAL ANESTHESIA

DR. FRANZ TOREK

The method of regional anesthesia and its advantages over general anesthesia being discussed by one of the speakers of the evening, I shall not touch on them except insofar as they have any bearing on the cases here presented.

I. Mrs. M. P., who gave symptoms suggestive of *renal calculus*, was cystoscoped by Dr. Graeser. The right

kidney secreted normally, the left not at all. Ureteral catheters were introduced. On the left side the catheter met an obstruction above the middle of the ureter. A roentgenogram, taken with the catheters in place, showed a shadow at the site of the ureter, between the 3d and 4th lumbar vertebrae. The tip of the catheter was seen about ½ inch below the stone.

The patient was operated on December 2, 1924. Paravertebral anesthesia was induced by injecting from the 9th dorsal to the 3d lumbar vertebra, and to this was added a regional block at the site of the operation. The operation was painless up to the point when the ureter was to be exposed. At this stage one may deaden the sensation of pain by a renewed injection into the pedicle of the kidney and the adjacent peritoneum or one may induce a short, light narcosis. The latter is especially indicated in cases of very short pedicle and large tumor, in which case even the mobilization causes pain by traction at the pedicle. The brief employment of a general anesthetic in such a case does not detract in any way from the merit of the regional anesthesia. It was administered in this case.

The ureter was found much dilated for 4 inches from the kidney downward, the rest being normal in size. At the transition point it was bent somewhat, and a stone was felt there. It was removed through a small incision. A bougie introduced through the incision and carried down to the bladder proved that there was no obstruction below. The incision was closed by a single suture, after which the administration of the anesthetic was stopped. A cigarette drain was introduced to the site of the suture and the wound was closed. The patient was awake again before the suturing had been completed. No leakage occurred in the course of the recovery.

II. Mrs. T. N. *Calculus in Pelvis of Kidney.* Operation November 10, 1924. Paravertebral and regional anesthesia as in the previous case. The urine contained a goodly amount of albumin, as well as hyaline and granular casts; it also showed the presence of a small amount of sugar and diacetic acid. In consideration of these findings it was evident that the avoidance of a general anesthetic was desirable. The twelfth rib was removed, a procedure which secured ample room. In regard to this step I may say that until about a year ago I avoided resecting the twelfth rib, being influenced by writers who warned against it, but it is quite certain that the division of the triangular ligament does not give as much room as the removal of the rib and does not absolutely secure against opening the pleura. In operating under regional anesthesia it is advisable to avoid vigorous tugging with retractors and to establish, rather, so good an exposure that moderate retraction will suffice; therefore in many cases of kidney operation the removal of the twelfth rib will be a great help.

The pelvis of the kidney was incised and the stone extracted, after which the pelvis was sutured with three fine chromicized catgut stitches. A cigarette drain was introduced to the vicinity of the suture line and then the wound was closed. The drain was removed on the fifth day. There was no leakage. The wound healed completely in two weeks. No general anesthetic was given in this case.

III. Mrs. M. M. *Pyonephrosis.* This was an extremely sick patient who had been refused operation at the hands of two surgeons who were not accustomed to local anesthesia work. Her feebleness was so great, that her chances of going through a narcosis were rather slight. However, she stood the operation under regional anesthesia very well, no general anesthetic being given, and she made a perfect recovery. The case showed most strikingly the value of local anesthesia.

IV. Mrs. C. S. *Hypernephroma of the Kidney.* Operation November 3, 1924. This patient had a large tumor and a short pedicle, so that in spite of removal of the twelfth rib the delivery of the kidney offered great difficulty; therefore a short narcosis was induced at that stage of the operation. The patient was awake before the operation was completed. Recovery was uneventful and rapid. This patient also has a moderate degree of hydronephrosis of the remaining kidney, which emphasizes the importance of avoiding the additional burden that a general anesthesia might impose upon that organ.

V. Mr. H. P. *Papillary Carcinoma of the Pelvis of the Kidney.* This patient had been passing bloody urine for 4 months, and the loss of blood had weakened him considerably. Nephrectomy was performed. as in the preceding case, December 27, 1924. Here also the pedicle was short, but the kidney not being large, no general anesthetic was needed for mobilizing it painlessly. Recovery was uneventful.

One of the great advantages of regional over general anesthesia in kidney operations is that patients may be allowed to drink copiously immediately after operation, thus avoiding the necessity for introducing water per rectum or subcutaneously following operation to supply the fluid that all these patients need.

Discussion

DR. WILLY MEYER: I have followed with keen interest and pleasure the presentation of the patients by Dr. Torek and the instructive material discussed by Dr. Lowsley. Paravertebral anesthesia was first introduced by Kappis and published in 1912 by the University of Kiel, Germany. Those interested in thoracic work quickly grasped its possibilities and gave it a thorough test. I made use of it quite frequently years ago when trying to improve by extrapleural compression cases of bronchiectasis, and I was very enthusiastic about it. While resecting many ribs in thoracoplastic work we conversed with the patient during the entire painless operation. I used it, as I said, a number of times until one patient with diffuse tuberculous infiltration of the lung went into fatal collapse. I was very much mortified until I read in the literature of a number of lethal cases following the same method of anesthesia. Since that time I do not go down to the neck of the rib depositing there about 3 c.c. of the novocain and adrenalin solution and then, changing the direction of the needle, push it on in order to infiltrate the posterior branch of the thoracic nerve. I rather followed the method of infiltrating the nerve at the angle of the rib. It may be that in injecting the lower intercostal and then the lumbar nerves there is less danger of direct subarachnoid absorption. But I believe one could abandon the preliminary injection altogether and just secure a local anesthesia for the incision of the skin then after having reached the ribs inject the thoracic nerves directly and individually. Certainly this means of anesthesia represents a great advance in urological surgery.

With reference to the operation itself, I have always resected the twelfth rib in my renal surgery for over 30 years. My only exception was when it was not indicated, when a very movable kidney had sunk down. If we resect the twelfth rib with care, entirely subperiostally, and then laying the knife and scissors aside, use only blunt retractors, we will not injure the pleura. The removal of the twelfth rib is a very great help and gives ample access to the kidney, its pelvis and the upper portion of the ureter. In removing a large renal tumor one needs only use a short additional horizontal incision in order to deliver the growth. In later years the scar of a transmuscular abdominal incision sometimes produces discomfort. The longitudinal incision will never cause the patient to complain of this.

I have done decapsulation of the kidney for advanced nephritis by request and I used regional and local anesthesia with much benefit to the patient. We certainly are indebted to the men who have worked out this method. It deserves the attention of all surgeons.

BILATERAL BRANCHIAL FISTULA

DR. JAY DASHIELL WHITHAM

Mrs. H., nurse, aged 38, was first seen on June 15, 1924, when she complained of discharging fistulas on each side of her neck (figure 1.) She said she had had this trouble all her life. That on the right side discharg-

ed continuously and causing much annoyance; that on the left side discharged only occasionally. A small discharging opening was noted on each side along the anterior borders of the sterno-mastoids and about two

Fig. 1. Bilateral complete branchial fistulas (Dr. Whitham's case).

inches above the clavicle. A probe could be passed into each tract but could not be made to enter the pharynx. The passage of the probe was attended by exquisite pain and spasms of coughing. The right tract was injected with barium paste. The tongue was then depressed and the barium was seen emerging from the tonsillar sinus at the lower pole of the tonsil. A roentgenogram, then made, showed the condition very nicely. (figure 2.) Two weeks later the right tract was removed under ether anesthesia. It was first injected with a strong solution

Fig. 2. Roentgenogram of barium-filled branchial fistula (Dr. Whitham's case).

of methylene blue. A long incision was made in a natural skin furrow of the neck. The dissection was easy and the tract was large and thick, until the bifurcation of the carotid was reached. Here the dissection became most tedious as the tract was almost hair-like in thickness. The wound was closed without drainage and healed completely. In this case it would not have been practicable to follow the method advised by von Hacker which resembles the Mayo operation for varicose veins of the leg and is carried out, in brief, as follows: After the carotid bifurcation has been passed a filiform bougie is passed through the fistula. One end is brought out through the mouth, the other is tied to the stump of the tract. By traction on the mouth end of the bougie the tract is pulled out into the pharynx and cut off. Some operators advise removal of the tonsil but no reason was seen for it in this case.

The case here shown was a complete branchial fistula for it opened externally on the surface of the neck and internally into the tonsillar sinus. The anatomical relations of this type of fistula are constant. From the skin of the neck, often as low as the clavicle, it extends upward to the border of the sterno-mastoid muscle thence it passes to the hyoid region where it crosses the digastric muscle, passes through the bifurcation of the carotid artery, thence goes under the stylo-pharyngeus and stylo-glossus muscles, crossing the 9th and 10th cranial nerves and enters the throat in the tonsillar region.

(*No discussion*)

BONE GRAFT OF JAW, FIVE YEARS POST-OPERATIVE

DR. JAY DASHIELL WHITHAM

Mr. F. age 32, an army sergeant, was wounded in the lower jaw and face by a shell fragment in the summer of 1918. This injury and subsequent infection caused a loss of about one and one-half inches of his mandible. I first saw him about one year later and after the construction of a suitable interdental splint for the maintenance of proper dental occlusion, I inserted a bone graft about 1½"x½"x⅜" into the defect. The graft was obtained from the left tibia and was secured in place by a silver wire suture at either end. The result is, as can be seen, a serviceable jaw and very little deformity.

I have done this operation ten times with seven successes and three failures. The failures seem to be the result of infection. The preparation of the bed for the graft requires care for the mandibular ends must be perfectly freshened, all scar tissue must be excised and the mucous membrane of the mouth must not be buttonholed. I thought it might be of interest to see the result of one of these cases after the lapse of five years.

(*No discussion*)

SADDLE-NOSE DEFORMITY

DR. JAY DASHIELL WHITHAM

This case is one of a woman, aged 19, who had an extreme saddle-nose deformity resulting from congenital syphilis. (figure 1.) The nasal septum was almost entirely destroyed, and the soft tissues overlying the nasal bridge were so thin that it was considered best to insert the rib cartilage through an incision at the root of the nose. Prior to operation, about two years of antisyphilitic treatment had been given and a negative Wassermann reaction obtained. A plaster cast of the face was made and a correct nose was reconstructed on the cast by the use of wax. In this way a model was obtained of the graft needed to make the correction. The latter was obtained in the usual way, from the seventh right costal cartilage, and was inserted so that the nasal tip was forcibly depressed. The operation was followed by a slight bronchitis but the wounds healed quickly. The second picture (figure 2) was taken about six months after the operation.

ELONGATED AND HUMP NOSE

DR. JAY DASHIELL WHITHAM

Probably the most frequent type of unsightly nose is the long pendulous form. The pendulous portion does not contain septal cartilage, but is formed by an over-development of columnar cartilage, alar cartilage, fibro-adipose tissue and skin and it is only by the removal of this redundant portion that a satisfactory correction will be obtained. The mere removal of a wedge of septal cartilage is not sufficient to correct the majority of elongated noses. The pendulous nose is usually a humped nose and the operation now to be described is an easy simple method of removing both of these defects. The operation is easy because the field is

open at all stages. For this reason the correction is much more likely to be complete than is the case with the much more difficult intranasal method. The operation is performed under ether. Although local anesthesia could be used, it is not the best way. The eyelids are covered with

Fig. 1. Saddle nose, before operation (Dr. Whitham's case).

sterile petrolatum and a sterile bandage. A postnasal plug is inserted. The skin of the nose, the vestibule, the cheeks and upper lip are coated with one half strength tincture of iodin, which is removed in two minutes with alcohol.

Fig. 2. Saddle nose, after operation (Dr. Whitham's case).

A horizontal incision is made through the columna nasi at its point of attachment to the upper lip and this structure is separated throughout its length from the edge of the septal cartilage as described by Gillies in his operation for cartilage implant in saddle-nose.

The columna nasi, now free except for its attachment at the tip of the nose, is tilted up and the skin overlying the bridge and sides of the nose is separated subcutaneously by straight blunt-pointed scissors and double-edged knife. This maneuver allows the skin to be partly retracted upward thus exposing the hump, which is removed by scissors, chisel and rasp. Plenty of time should be taken to do this completely as the tendency to remove too little is a strong one. It now remains to shorten the long tip of the nose. A fairly large quadrilateral piece of tissue is removed from the under surface of the tip of the nose. The piece consists of a small triangular section from each alar cartilage and fibro-adipose tissue. The columna nasi is now turned back into its original position and if the correction

Elongated and hump nose. Before and after operation. (Dr. Whitham's case.)

is not complete a small piece of triangular cartilage may have to be removed.

If the wings of the nose still drop down too far, it now remains to trim them with a sharp knife by excising from the edge of each ala a triangular piece of tissue. This is done by making a horizontal incision through each ala, the two incisions approaching each other mesially until separated by a distance exactly equal to the width of the columna nasi. The edges of the alae are now turned under with accuracy and sutured to the skin of the nasal vestibule. A portion of columna is now excised and the stump is sutured into place with silk. The edges of the newly formed columna are also sutured to the septal membranes on each side. Each nostril is lightly packed with cotton and petrolatum. No other dressing is required but for a few hours cold compresses over the nasal bridge are possibly of benefit. The cotton should be changed daily and the stitches removed about the fifth day.

The last steps of the operation require precision, but are certain to be successful if carefully planned. The only scar remaining is one about 3/8 inch long on the under surface of the columna which is absolutely quite invisible. The results shown by the photographs of a case before and after operation.

Discussion

DR. J. EASTMAN SHEEHAN: I should like to add a word to what Dr. Whitham has said concerning the syphilitic nose. There are three main types of this disfigurement. In the first there is a condition resembling the ordinary depression of the bridge. This can be repaired by an implant of cartilage. The second is of the type Dr. Whitham has shown. The covering may be intact, but the membranes beneath have been replaced by contracted scar, as result of which the nose has been drawn out of shape and the adjacent facial lines have been distorted. I did not understand Dr. Whitham to say how he provided a lining. Unless a lining is provided as substitute for the mucous membrane that has been destroyed, eventually there will be sloughing and a failure of the repair. In the third type the destruction is so extensive, lining, bridge and covering all being involved, that the only recourse is to rhinoplasty.

I do not agree that the incisions should be made externally. Implanting cartilage can best be effected, in cases of the first type, through an incision in the colum-

ella, from which the inner tissues can be readily separated and readjusted.

The columella offers a ready access to the nose. It may be incised along its midline, or lifted from the philtrum, or incised along its length interiorly and retracted to one side. The incision for lifting the columella originated with Mr. Gillies some years ago, while I was at Sidcup, and I described it in a paper read before the Academy in January, 1921.

Cases of the second type are most readily approached by an incision over the gingival line, through which the scar tissue can be removed and the nose prepared to receive a Thiersch graft lining, held in place by a moulded stent affixed to a dental splint. The lining is the key to success in these cases of the second and third types. Unless a lining is provided successful repair cannot be looked for. Usually the lining for the third type can be formed of flaps turned over from the cheeks and joined over the bridge.

DR. WHITHAM: In closing the discussion I only wish to say that as regards the case of the young girl and the use of the incision at the root of the nose, I hold my ground on that as in that case there was great risk in putting in a graft in any other way. Had the rib cartilage been inserted through an incision at the tip of the nose, as suggested by Dr. Sheehan, undue pressure would be exerted at the point where the stitches were placed. The scar from the incision at the root of the nose has never worried the patient and is inconspicuous; in fact it is scarcely noticeable.

RESTORATION OF THE CHEEK AND TEMPORAL REGION BY PEDICLED AND SLIDING GRAFT OF SKIN AND MUSCLE*

DR. JAY DASHIELL WHITHAM

The treatment of cutaneous angiomas or "port-wine" birthmarks by the roentgen ray is not satisfactory and the case reported here will illustrate in an extreme degree how dangerous it may be to attempt this form of therapy. The case has special interest as the roentgen-ray treatment was given by an eminent roentgenologist who is a teacher of this subject in one of our medical colleges. W. E. E., male, aged 23 years. (His mother died of dropsy at the age of 40, and his family history otherwise was negative. He had the diseases of childhood, including measles, chickenpox and mumps. He stated that he had smallpox in 1911, and that he fractured his left forearm when a small boy.) Venereal infection was denied. He was told by his parents that at birth he had a "port-wine" birthmark covering almost the entire right side of his face. Nothing was done to remove this blemish until December, 1917. At that time, he stated, he feared the birthmark would disqualify him for military service, and to insure his acceptance in the army, he applied for treatment to his physician, who referred him to a roentgenologist. The patient stated that he was given about 18 roentgen-ray exposures, each from five to ten minutes duration. These were given in series of three consecutive days, with rest periods between. About March 15, 1918, two weeks after his last roentgen-ray exposure, a blister formed over the birthmark, then ruptured and exuded serum. Part of this blister had healed when he was inducted into the army, May 25, 1918. A few days later, ulceration and sloughing began to occur, affecting at first the skin and soft tissues of his cheek, and soon spreading to the temporal region and deeper structures. By September, the soft tissues of the cheek had sloughed off, leaving a large opening into his mouth and nose through the maxillary sinus.

On February 16, 1919 these notes were made: "Patient weighs 160 pounds (normal weight, 180 pounds). The right malar bone and a large part of the right superior maxilla are denuded and necrotic, with a very bad odor. The undestroyed portions of the right masseter and buccinator muscles are exposed. He has an intense right orbital cellulitis."

On March 28th, 1919, the right eye was enucleated, as the bulb was virtually destroyed. At the same time, the right malar bone and a portion of the right superior maxilla were removed as sequestrums.

May 28th, an extensive destruction of the squamous portion of the temporal bone and overlying soft tissue was present. Sloughing tissue and necrotic bone was removed down to the inner plate of the temporal bone. The temporal region remained open, discharging foul-smelling pus for several months; but, after the removal of several small sequestrum, it began to granulate over, so that by November 10, 1919, the bone and soft tissues were covered with epithelium, except for an ulcerated patch about one-half inch square, just below the outer angle of the orbit.

September 29th, the patient had a typical attack of Jacksonian epilepsy, involving the side of the body opposite the lesion. This attack was of fifteen minutes duration and was followed by profound sleep. He became very cyanotic during the attack and death seemed imminent. This attack was repeated about three months later, but was less severe.

By February 19, 1920, the wounds were clean and the patient, having spent several weeks on a farm, was in excellent physical condition. Previous to that date, a wax model of the face had been made and the operation contemplated was rehearsed, exact patterns of flap needed being cut from thin sheets of tin. The object of the first operation was to provide a covering for the maxillary sinus and to cover over the hideous loss of tissue of the cheek.

Operation and Results. February 19, under procain anesthesia, a skin lining for the outer wall of the maxillary sinus was made by the turning together of two flaps—one from the cheek below the opening and the other from the side of the nose. These were sutured together with interrupted silk stitches. This step I believe to be essential to the success of the operation. A large, pear-shaped flap including tissues down to the pericranium was then cut from the right forehead, having a thick pedicle, including all the tissue between the eyebrows. This was brought down and sutured without tension, over the turned-in flaps. Interrupted skin sutures of dermol were used. Small rubber tissue drains were placed in each lower angle of the wound. A little nitrous oxid gas was then given. The scalp was extensively undercut in the right parietal region and the forehead wound closed by button tension sutures of silkworm gut. The wounds healed quickly.

On April 5th, the second operation was performed. This was designed to restore the soft tissues over the temporal region, to cover the exposed dura in this region with healthy skin and muscle and to effect a cosmetic result. The wound in this location was carefully freshened, and at that time it was noted that in several places the squamous plate was entirely wanting. Two horizontal parallel incisions were made in the scalp, commencing above the right ear and extending back to the region of the external occipital protuberance. The incisions were 2½ inches apart. The flap, thus outlined, was cut to include the remnants of the temporal muscle, was brought forward by sliding and sutured into the defect by interrupted silkworm-gut stitches. The defect was thus covered with healthy scalp and a portion of the temporal muscle. The scars resulting were for the most part in the hairy portion of the scalp and therefore not so very conspicuous. A month later the pedicle of the forehead flap was returned. At a future date, still further improvement can be obtained by scar excisions.

By May 1, 1920, the wound had healed. The patient has had no recurrence of his convulsions, has gained 25 pounds in weight, and is now in perfect health.

*This case was reported, with illustrations, in the *Journal of the A. M. A.*, February 12, 1921.

American Journal of Surgery
PUBLISHED BY
SURGERY PUBLISHING CO.
Established by J. MacDonald, Jr., M.D.

ADMINISTRATION AND EDITORIAL OFFICE
15 EAST 26TH ST., NEW YORK, U. S. A.,
where all communications intended for the Editor, original articles, books for review, exchanges and business letters should be addressed.
Publication Office: 425 Carroll Street, Elmira, N. Y.

SUBSCRIPTION PRICE, TWO DOLLARS
FOREIGN, TWELVE SHILLINGS

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.
It is of advantage to submit typewritten manuscript; it avoids errors.
CHANGE OF ADDRESS. Subscribers changing their address *should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.*
ILLUSTRATIONS. Half-tones, line etchings, and other illustrations will be furnished by the publisher when photographs or drawings are supplied by the author.

SPECIAL NOTICE TO SUBSCRIBERS
The American Journal of Surgery is never sent to any subscriber except on a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, B.S., M.D., F.A.C.S., *Editor*
New York City

ELMIRA, N. Y., JANUARY, 1926

JEJUNOSTOMY IN ACUTE GENERAL PERITONITIS

In general peritonitis it may be much more important to drain the bowel than to drain the peritoneal cavity. This is a somewhat epigrammatic way of saying that, within limitations, the peritoneum can take care of the poisons elaborated in its surface, but the patient dies of the poisons elaborated within the paretic and distended gut.

In relatively mild cases of paralytic ileus much can be accomplished with enemata and, especially, with pituitrin. In cases of diffuse purulent peritonitis, with the intestines paretic and inflamed upon their serous surface, it is better to provide direct mechanical drainage. Crump (The "Acute Abdomen", the JOURNAL, January, 1924) does this by stitching into small openings in the distended coils, one or more long but small-calibered tubes which, hanging over the table, drain the bowels of their toxic fluid while the operation is in progress, and are afterwards used for irrigating the intestine and for introducing medicaments. Inserted in the manner of a Witzel gastrostomy, there is no leakage when these tubes are removed.

In intestinal obstruction the most intense poison appears to form in the upper end of the intestinal tract—the duodenum and the jejunum. For this reason and also as a means of feeding when, as so often is the case, the stomach can retain nothing, it has appeared desirable to make the intestinal drainage in peritonitis in the jejunum itself. Seton Pringle, of Dublin, (*The Lancet*, 1923, 2, 62 and 1925, 1, 869) has thus recommended jejunostomy as a life-saving measure in acute general peritonitis, and credits Victor Bonney with having first suggested its employment in these cases in 1910.

A secondary operation will be necessary to effect closure if a large opening is made or if the jejunum is stitched to the parietal peritoneum. Neither of these things should be done. Says Pringle:

> The operation I have performed is after the manner of a Witzel's gastrostomy—a No. 12 soft rubber catheter is inserted into the lumen of the intestine through a small puncture and fixed in position by a single catgut stitch, the next couple of inches of catheter are buried in the intestinal wall by a continuous in-folding stitch, and the proximal end is passed through a hole in the omentum, as described by Mayo, before being brought out through the abdominal wall. To the end of the catheter a long tube is attached to drain into a bottle beside the bed.
>
> At frequent intervals 6 to 10 oz. of bicarbonate of soda solution are run into the intestine, the end of the tube then being immediately depressed and replaced in the receptacle so that the toxic intestinal contents are diluted and their escape by siphonage encouraged. The outflow from this tube can be completely controlled and, as soon as it ceases to be the dark foul-smelling fluid characteristic of intestinal obstruction, the tube can be clamped in the intervals of being used as a means of introducing a soda and glucose solution. In a week or ten days the catgut stitch holding the catheter in situ is absorbed and the catheter is then removed—in no single instance in my experience has there been any subsequent escape of intestinal content, and thus no necessity for further operation.

Jejunostomy is easy of performance at the time of the primary operation, and even in very ill patients it is usually easy, under local anesthesia, as a secondary procedure. It may prove life-saving in desperate cases, and may advisedly be undertaken in cases of peritonitis before they become desperate.

CYSTITIS

It has been shown experimentally that the normal urinary bladder is resistant to infection by pyogenic bacteria. In an editorial in the JOURNAL, July, 1924, we said:

> Modern urology has brought the growing conviction that in the normal, untraumatized bladder, primary bacterial cystitis rarely if ever occurs; that in such a bladder cystitis is an extension of infection from the urinary tract above or below, or from contiguous pelvic structures; that in the absence of such an extension a bacterial cystitis is caused by injury or by the presence of a tumor, stone or foreign body or is due to the retention of urine arising from the inability of the bladder completely to empty itself—as the result of obstruction (prostatic, urethral) or distortion (diverticulum, cystocele) or impairment of innervation.

Subsequent publications have brought further evidence to this "growing conviction." Indeed, the factors concerned in the development and continuance of a cystitis may be said to be now sufficiently established to require an abandonment of the no-

tions held until recent years. From his published Observations on the Etiology and Treatment of Cystitis, H. W. B. Cairns of London (*The British Journal of Surgery*, July, 1925) made the following summary:

1. Cases of cystitis fall into two main groups: (*a*) Those which clear up quickly, either spontaneously or after simple forms of treatment (*resolving cystitis*); and (*b*) Those which become chronic (*progressive cystitis*).

2. The paths of bacterial infection in resolving cystitis are not completely understood. In some cases the infection undoubtedly comes from the kidney, in others possibly from the prostate. There remain, however, many cases in which it is impossible to determine the source of the infection.

3. Chronicity in cystitis is due to a number of conditions. In rare cases it is due to a solitary ulcer of the bladder, a condition of unknown etiology. In most cases it is due either to persistant infection from the kidney or to the presence of retained (or residual) urine in the bladder.

4. A persistent focus of infection in the renal pelvis may give no clinical signs. Evidence obtained by cystoscopy is frequently of great value in the detection of such foci. If the lesion of the renal pelvis is treated efficiently, the cystitis will clear up at once.

5. Any variety of retention of urine may produce progressive cystitis. The successful treatment of retention cystitis depends entirely on the establishment of complete drainage of the bladder either by natural or artificial means. Bladder irrigations are of great service in this variety of cystitis.

6. When cystitis occurs in a case of unrelieved acute retention there is grave danger that it will be followed by ascending pyelonephritis, a condition which is usually fatal. When it is realized that all cases of retention of urine require immediate and complete relief, then only will ascending pyelonephritis, the occurrence of which is a grave reflection on the teachings and practice of surgeons of to-day, cease to be common. Drainage of the distended bladder is an operation of greater emergency than that of drainage of a pelvic abscess.

7. Finally, cystitis, though a distinct clinical entity, is usually secondary to some other lesion of the urinary tract. It should not be treated empirically; the exciting and predisposing causes should be sought by a thorough investigation of the whole of the urinary tract. When these causes have been dealt with, the inflammation of the bladder will subside of its own accord.

We quote this summary because it is fairly expressive of the factors concerned in the maintenance of a cystitis and, because, especially, it duly stresses that most important factor—retained or residual urine. It must be clear that, in the management of a purulent cystitis, next most important after the removal of any other cause (e. g., calculus)—and certainly more important than the administration of antiseptic, acidifying or alkalinizing medicaments—is it to keep the bladder drained of urine, continuously or frequently, by catheterizing and by irrigations. As we mentioned in the previous editorial, it seems to us, also, that Mills is right in saying that post-operative catheterization, if once begun, should not be discontinued until the bladder has resumed its power to empty itself completely:—the residual urine is the invitation to the development of cystitis. We have been too prone to blame it on the failure of a nurse or a physician to observe strict catheter asepsis.

Likewise should it be borne in mind, as Cairns has stated, that in instances of acute cystitis, with high fever, as develops, for example, after catheterizing the paralyzed bladder, there is often a very early involvement of the kidneys in the infection.

Book Reviews

Abdominal and Pelvic Surgery for Practitioners. By RUTHERFORD MORISON, HON. M.A. & D.C.L., HON. LL.D., M.B., F.R.C.S. (ED. AND ENG).; Consulting Surgeon, Royal Victoria Infirmary and Dental Hospital, Newcastle-on-Tyne; Consulting Surgeon, War Pensions Hospital; Emeritus Professor of Surgery, Durham University. Duodecimo; 212 pages; illustrated. HUMPHREY MILFORD, OXFORD UNIVERSITY PRESS, 1925.

The author has attempted with very great success to present the quintescence of his wide experience in abdominal and pelvic surgery. The book is addressed primarily to the "general practitioner", the outstanding unit of the medical profession. While not disparaging the value of the more exact instrumental methods of surgical diagnosis, Morison stresses the importance of careful clinical observation. To his mind it is more important to determine the kind of patient the disease has got, than to establish the kind of disease the patient has got. With this idea dominating the purpose of his book, the author proceeds to select case histories in the discussion of which the interesting diagnostic or therapeutic points are developed.

The volume is roughly subdivided into three main chapters which deal with the acute abdominal emergencies, the subacute and the chronic abdominal conditions. More stress is laid on the diagnostic than on therapeutic aspects. The whole work is extremely interestingly written and should prove of value not only to the general practitioner but to the surgeon as well.

Some Encouragements in Cancer Surgery. By G. GREY TURNER, F. R. C. S., Eng.: Honorary Surgeon, Royal Infirmary, Newcastle-upon-Tyne. Octavo; 75 pages; illustrated. New York: WILLIAM WOOD AND COMPANY, 1925.

This little book is the outcome of a lecture delivered by the author before the surgical section of the Royal Society of Medicine. It contains a number of very interesting photographs of carcinomata removed from patients, some of whom were alive many years later. Nothing new, not even in viewpoint, is offered and the upshot of the whole work is that cancer is not so dreadful a disease provided early and radical therapy can be instituted. All in all, the most that can be said to justify the expression of this wisdom in book form is that Turner wrote it.

A Textbook of Obstetrics. By THOMAS WATTS EDEN, M.D., C. M. (EDIN.), F. R. C. P. (LOND.), F. R. C. S. (EDIN.), Major R. A. M. C.; Consulting Obstetric Physician to Charing Cross Hospital; Consulting Physician to Queen Charlotte's Lying-in Hospital; Consulting Surgeon to Chelsea Hospital for Women; etc., and EARDLEY HOLLAND, M.D., B.S. (LOND.), F. R. C. P. (LOND.), F. R. C. S. (ENG.); Obstetric and Gynecological Surgeon, and Lecturer on Obstetrics and Gynecology, the London Hospital; Surgeon, the City of London Maternity Hospital, etc., etc. *Sixth Edition.* Octavo; 704 pages; 7 plates and 393 illustrations. New York: *The MacMillan Company*, 1925.

Those interested in obstetrics as a specialty will find this book of the greatest value. In the vast amount of information it offers, one is impressed particularly with the conciseness with which it is written, with the definiteness of the facts stated, with the lack of unnecessary descriptions and with the admirable classifications which are given throughout the work.

Part I, covering Ovulation, Menstruation, Fertilization and Early Development and Imbedding of the Ovum, De-

cidua, Chorion and Placenta, is very lucid, and the embryological facts, usually so complicated and difficult of perception, are made very clear and easy to understand. In this part also, normal pregnancy is fully and concisely described and the newer work is considered, especially with reference to metabolism. The serum reactions of pregnancy are also discussed.

Part 2 deals with abnormal pregnancy. There are admirable classifications of the disorders of and the disorders associated with pregnancy, and the whole part gives a wealth of information in its 112 pages. Particularly good is the paragraph on the toxemia of pregnancy and eclampsia in which the scientific aspect is well covered. Especially valuable also is the paragraph on Hydatid Mole.

Parts 3 and 4 deal with normal and abnormal labor, and are complete in every respect. The clinical phenomona, anatomy and physiology, mechanism and management of labor, are very well described. Especially good here are the paragraphs on the diagnosis and prognosis of labor, narcosis and anesthesia in normal labor, and uterine stimulation in labor. The chapter on abnormal labor is concise and replete with valuable information on all abnormalities. No conceivable abnormality is omitted. Placenta previa, accidental hemorrhage, and post-partum hemorrhage are very fully described.

The last five parts of the book describing the normal puerperium, the newborn child, with the injuries and diseases associated with it, and the obstetrical operations are really very well written. The finer points appertaining to obstetric operations are treated without any omissions.

Among other criticisms, we regret that the authors make no mention of the Tarnier basiotribe, that they still explore and douche the uterus in sepsis, and that in the treatment of post-partum hemorrhage they relegate packing of the uterus to the last step instead of using it as a first measure.

Diseases and Deformities of the Foot. By JOHN JOSEPH NUTT, B.L., M.D., F.A.C.S.; Professor of Orthopedic Surgery, Polyclinic Medical School and Hospital; Surgeon-in-Chief, New York State Orthopedic Hospital for Children; Orthopedic Surgeon, Willard Parker Hospital, Nyack Hospital and Rockland County Hospital; Member of the American Orthopedic Association. *Second Edition.* Octavo; 309 pages; 105 illustrations. New York: E. B. TREAT AND COMPANY, 1925.

Twelve years having elapsed since the publication of the first edition of this manual, a general revision has been necessary to bring it up to date.

The work is an elementary one, not intended for orthopedists; but it describes clearly the fundamentals in the treatment of various congenital and acquired diseases and deformities of the feet.

Intravenous Therapy. Its Application in the Modern Practice of Medicine. By WALTON FOREST DUTTON, M.D.; Visiting Physician to the Northwest Texas Hospital; Visiting Physician to St. Anthony's Sanitarium; Director, Medical Research Laboratories, Amarillo, Texas; etc., etc. *Second Edition.* Octavo; 594 pages; 64 illustrations. Philadelphia: F A. DAVIS COMPANY, 1925.

It is gratifying, in this second edition, to find the prefaced disclaimer of the commercial exploitation to which so much of the first edition has been subjected.

The first part of the book is an excellent presentation of the history and practice of transfusion and of intravenous medication with the chief emphasis placed upon the administration of salvarsan. This part is most acceptable and even the most expert may find valuable suggestions for the improvement of technic.

The second half of the book is devoted to a consideration of an alphabetic list of diseases and conditions from acidosis to yellow fever. It contains an uncritical catalogue of intravenous recommendations. For the utterly unimaginative physician, for whom it is apparently designated, it may prove to be a dangerous inspiration.

The valuable study of Hanzlik on the contraindicatcns and dangers of intravenous therapy is unfortunately unmentioned. The reviewer cannot agree that intravenous medication is *à priore* the method of choice for scientific application nor that intravenous administration of serum should be relegated to a separate treatise.

The book is attractively printed and the illustrations leave little to the imagination. Beautiful colored half tones illustrate hypodermatic injections and extractions from the veins in various parts of the body.

A Textbook of Physiology. By WILLIAM D. ZOETHOUT, Ph. D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University) and in the Chicago Normal School of Physical Education. *Second Edition.* Octavo; 616 pages; illustrated. St. Louis: C. V. MOSBY COMPANY, 1925.

As a text for dental students this physiology will serve its purpose provided the class teaching is able. It has the shortcomings of most compends and also attempts to cover much ground usually left for the anatomists and clinical miscroscopists.

Post-Mortem Appearances. By JOAN M. ROSS, M.B., B.S. (LOND.), M.R.C.S., L.R.C.P.; Assistant Pathologist to St. Mary's Hospital. Duodecimo; 216 pages London and New York: HUMPHREY MILFORD, OXFORD UNIVERSITY PRESS, 1925.

Macroscopic pathology can, of course, be learned nowhere but in the autopsy room. Still there has been a great dearth of works descriptive of the gross appearances of the different organs of the body affected with a special disease. This gap in the literature the author has attempted to fill, by giving thumb nail sketches of what may be expected in the various diseased organs. The diseases are grouped under the system in which the principally involved organ belongs. Thus, the infections are grouped separately and diseases of the digestive system, the respiratory system, etc., separately. The volume should be a very welcome addition to the library of the student of pathology.

The Practical Medicine Series. Comprising eight Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of CHARLES L. MIX, A.M., M.D. *Volume II. General Surgery.* Edited by ALBERT J. OCHSNER, M.D., F.R.M.S., LL.D., F.A.C.S., F.R.C.S. Ire. (HON.); President American College of Surgeons; Surgeon-in-Chief Augustana and St. Mary's of Nazareth Hospitals; Professor of Surgery in the Medical Department of the State University of Illinois; etc. Octavo; 712 pages; illustrated. Chicago: THE YEAR BOOK PUBLISHERS, 1925.

This series, begun almost a quarter of a century ago by Murphy, and later carried on by the late Dr. Ochsner, is too well known and the character of the work too well established to require more than the passing notice that another volume has appeared. The advances in the various fields of surgery are passed in brief but stimulating review by means of well chosen and worded abstracts from the journals of the world.

Étude Anatomique des Artères de la Peau chéz l'Homme. Étude Radiographique. Par MME. PHILIPPE BELLOCQ. 64 pages; 29 figures. Paris: MASON ET CIE., 1925.

This rather interesting contribution to the anatomy of the skin vessels has been undertaken by Mme Bellocq because of the inadequate state of our knowledge in this respect. The work was carried on by means of injections of a suspension of red lead in turpentine. Following this the different skin areas were *x*-rayed. As a result of these studies, the author comes to the conclusion that the skin vessels may be divided into three main types; the type seen in isolated areas, the type with fine dermal anastomoses, the type of dermal and subdermal anastomoses. These different types of skin vascularisation may be seen in the same individual at different times of life. The work is fully illustrated with numerous *x*-ray photographs of the injected skin areas.